

Synthesis of Metal Oxides with Open Framework Structures

Allan J. Jacobson, University of Houston, DMR-0120463

A Homochiral Helical Chain Hybrid Compound

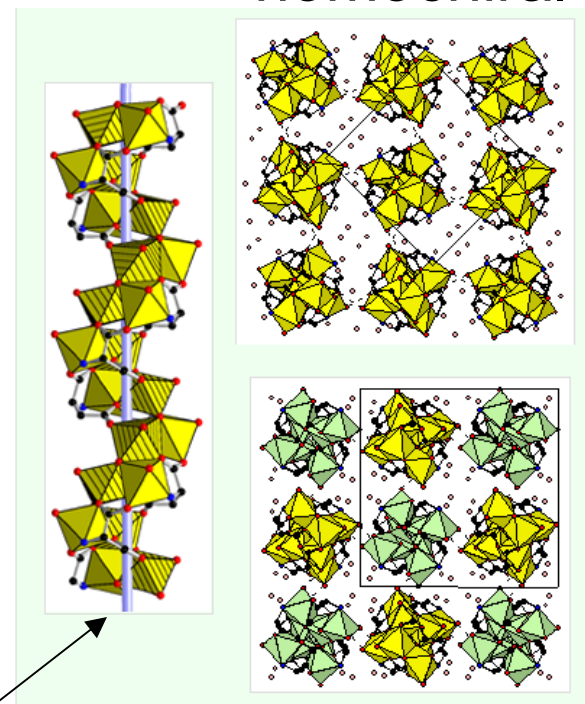
The increasing demand for materials for enantioselective catalysis and separation and the interest in fundamental aspects of chirality and molecular recognition have stimulated extensive research in the area of chiral coordination polymers.

The figure shows a new nickel aspartate oxide, $[\text{Ni}_2\text{O}(\text{L-Asp})(\text{H}_2\text{O})_2]\cdot 4\text{H}_2\text{O}$ which is, to our knowledge, the first example of a chiral one-dimensional compound with an extended helical metal oxide sub-network synthesized as an optically pure product. Its racemic analogue, $[\text{Ni}_2\text{O}(\text{d,l-Asp})(\text{H}_2\text{O})_2]\cdot 2\text{H}_2\text{O}$, is also shown.

Subsequent studies have shown that the helices may be linked with other ligands to form microporous homochiral structures with potential for enantiomeric separations.

$[\text{Ni}_2\text{O}(\text{L-Asp})(\text{H}_2\text{O})_2]_\infty$ helix

homochiral



racemic

Anokhina, E.V.; Jacobson, A.J. "[$\text{Ni}_2\text{O}(\text{L-Asp})(\text{H}_2\text{O})_2$] $\cdot 4\text{H}_2\text{O}$: A Homochiral 1D Helical Chain Hybrid Compound with Extended Ni-O-Ni Bonding," *J. Amer. Chem. Soc.* **2004** 126 3044-3045.

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Education:

Two graduate students, Tabatha Whitfield and Jenny Huang completed their Ph. D. theses in 2003 and 2004. Three graduate students YongBok Go, Pesak Rungrojchaipon, and Marie Vougo-Zanda, and one post-doctoral fellow Ekaterina Anokhina are currently working on the project. Several undergraduates (Tuti Adhitama, Sri Iyengar, Yazmin Dominguez, and Ling Bo) have also contributed to the research program.

Two students from UT El Paso, Katrina Castillo and George Ibave, participated in this years REU program and worked in the PI's research group



From left to right: Susan Wang (mentor), Katrina Castillo, PI, George Ibave and YongBok Go (mentor).